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India's Population: Past, Present and Future

Tim Dyson¹
(London School of Economics)

Preamble

It is a great honour to be asked to deliver this lecture in memory of Pravin Visaria. At one and the same time, he was one of India's leading economists and, still more, an extremely distinguished demographer. Indeed, from an international standpoint Pravin Visaria was widely considered to be this country's foremost authority on population matters. And it is probably true to say that during the second half of the twentieth century, no one made a greater contribution to our understanding of India's population than him.

It is not my intention here to review Pravin Visaria's many academic and administrative contributions - although I have attempted to do so elsewhere (see Dyson 2001a). Nor can I possibly do justice to his role in inspiring a generation of younger scholars. However, I must begin this talk by remarking on the immense *breadth* of his scientific contribution. It ranged over fertility, contraception, the family planning programme, and population policy. It included many articles on mortality levels, trends and differentials, and their implications, for example, for the country's sex ratio (i.e. its sexual composition). Pravin's research dealt with interactions between demographic growth and trends in employment and poverty. He published several key pieces which addressed issues of data quality - for example, in relation to the census and the NSS. And he was one of the world's leading authorities on migration and urbanisation (e.g. see Jones and Visaria 1997).

¹ This lecture draws on, and was written under the aegis of, a major research project on the future of India's population, involving an interdisciplinary team of researchers in India and the UK, and sponsored by the Wellcome Trust (grant number 053660). Until his death in February 2001, Pravin Visaria was one of the project's principal investigators, together with Leela Visaria, Robert Cassen and the present writer. An edited book, dedicated to his memory, and titled *21st Century India: Population, Environment and Human Development* is to be published by Oxford University Press (see Dyson, Cassen, and L. Visaria, forthcoming).

The present lecture is titled 'India's Population: Past, Present and Future'. Most certainly, Pravin Visaria was concerned with all three aspects of time. Thus with Leela Visaria he authored what is still the best single overview of India's population history (see L. Visaria and P. Visaria 1982). Also with Leela, he played a major role in regularly educating the general public - both in India and beyond - about the current state of the country's population, following the publication of results from successive censuses (e.g. see P. Visaria and L. Visaria 1981a, 1981b, 1994, 1995). And Pravin was always concerned with India's future - witness, for example, the various population projections made both with Leela Visaria (L. Visaria and P. Visaria 1996) and with Mari Bhat (Visaria and Bhat 1999).

The present lecture is framed in general educational terms (of which, I hope, Pravin would approve). It has two broad parts and it is quite deliberately 'broad-brush'. First, I want to provide an overview and appraisal of India's population trends during the past five decades. Second, I want to give you an idea of where the country's population is likely to go during the coming several decades.

From 1947 until 2003

The fabled diversity and complexity of India guarantee that the task of describing the country's demographic evolution since 1947 - let alone evaluating it - is well-nigh impossible. But momentous demographic changes there most certainly have been.

The most obvious place to start is with the inescapable issue of population *scale*. In 1947 India contained around 336 million people. The provisional results of the 2001 census gave a population total of 1,027 million - a figure which amounts to about 17 percent (i.e. one sixth) of all humanity (Registrar General, India 2001a). It appears likely that the 2001 census was a slight undercount. If we make a crude allowance for this, and adjust for subsequent population growth (i.e. growth during the past two years) then it seems probable that the true size of the country's population in March of 2003 is roughly 1,080 million.

So the population has more than trebled in size since 1947. That said, average levels of food availability and standards of living have generally improved. However, it must also be said that rises in levels of living may well have been greater if population growth had been less. Certainly, Pravin Visaria was someone who considered that greater population growth was likely to be an obstacle to the amelioration and eradication of poverty (Visaria 1975: 327).

The current population growth rate is probably about 1.7 percent per year - which implies an annual net addition to India's population of around 18 million people. This is only slightly lower than the 2.0 percent growth rate which applied around 1947. However, the demographic *basis* of this similar population growth rate has changed radically. In particular, the birth rate has fallen significantly, but the death rate has fallen by almost as much.

In the years around 1947 Indian women ended their reproductive careers with an average of nearly 6.0 live births each. After rising in the 1950s and early 1960s, the national birth rate probably started to decline in the late 1960s, and in 2003 the average level of fertility is probably about 3.1 live births per woman. Of course, as is well known, there is *very* significant regional variation in fertility. Levels of fertility are appreciably higher in the major northern states - like Uttar Pradesh, Madhya Pradesh, Rajasthan and Bihar - whereas states like Kerala, Andhra Pradesh and Tamil Nadu already approximate to a two-child norm (the so-called 'replacement' fertility level being roughly 2.1 births per woman). Nevertheless, fertility is now falling at an appreciable rate in *all* states which have levels of fertility that are above replacement - including UP, MP, Rajasthan and Bihar. And this fact will help to ensure that the national rate of population growth will almost certainly fall continuously during the coming few decades.

Ultimately - and as in all other countries - the fall in India's birth rate must be seen as a *delayed* response to the fall in the death rate (Dyson 2001b). In any human population, a sustained fall in the death rate instigates a period of population growth (i.e. demographic *dis-equilibrium*) which means that things are out of kilter. Although people usually don't realise that mortality has improved, the fact of its improvement - and, in particular, the fact that larger and larger numbers of children are surviving, and later entering the labour force - sets up a whole host of subtle and often indirect pressures which *eventually* lead people to make changes to their behaviour. So sooner or later there is a broadly corresponding reduction in fertility. In other words, the falls in fertility which are occurring in India today are *ultimately* a response to the improvement in the death rate. And these falls in fertility will eventually re-establish a rough measure of demographic balance (i.e. *equilibrium*) in the country. So the current falls in fertility are, at the end of the day, a reaction to the sustained improvement in mortality which started during the first half of the twentieth century, and which speeded up massively in the decades which followed 1947. The fact that, from the 1920s and 1930s onwards, India was a major pioneer in the family planning movement world-wide must be seen partly in this historical light.

But if fertility decline is ultimately a response to mortality decline, it can be *facilitated*, or hindered, by many different factors. Those which have conditioned the fall in India's birth rate are very complex (and I cannot possibly do justice to them here). But there is little doubt that fundamental aspects of north Indian society - especially as they condition the lives of *women* - have helped to explain why fertility has generally fallen appreciably later in the north of the country. Of course, Pravin Visaria's census monograph entitled *The Sex Ratio of the Population of India* (Visaria 1971a) was a landmark publication in highlighting the excess mortality, and associated biases, which females experienced in parts of northern India. Levels of education and female autonomy tend to be relatively low in the north. And I feel that in accounting for the generally slower demographic progress of northern India it should be borne in mind that the vast population of the Gangetic plain is densely settled, predominantly agricultural and, of course, it lives *inland*. Indeed, research increasingly suggests that - in very broad terms - India's fertility decline during the past several decades has gradually spread inland, and northwards, from coastal areas in the peninsular south (e.g. see Guilmoto and Rajan 2001; also Bhat and Zavier 1999). Perhaps not surprisingly, the country's massive demographic centre of gravity, the so-called Hindi heartland, has been last to change.

There is little doubt that, among other things (e.g. urbanisation and the mass media), improving levels of *education* have helped to *facilitate* India's fertility decline. Census data suggest that the national literacy rate has risen from about 16 percent in 1951 to about 65 percent in the year 2001. And the 2001 census classed about 54 percent of Indian females aged 7 years and above as 'literate' (Registrar General, India 2001a). There are encouraging signs that there may have been some acceleration in the country's progress in educating its children during the 1990s (e.g. see Kingdon et al. forthcoming). However, this should not obscure the fact that women with *no* education are quite capable of controlling their fertility. Perhaps this is most starkly demonstrated by the low average levels of fertility - close to the replacement figure of 2.1 - which *already* prevail in states like Kerala, Tamil Nadu and Andhra Pradesh. It is clear that today most women in these states are controlling their fertility *largely irrespective of their educational or other socio-economic characteristics*. Indeed, research shows that much of India's recent fertility decline is attributable to women with little or no education (see Bhat forthcoming; McNay et al. 2003). This fact is consistent with the idea that because over the long-run mortality decline has been sustained and pervasive, the fertility decline response will be sustained and pervasive too.

Turning to the *proximate* determinants of fertility - a small contribution to the falling birth rate has come from the increase in the female age at marriage. Thus today Indian women are probably aged roughly 21 years, on average, when they marry. But, of course, the main proximate cause of fertility decline has been the great increase in use of modern methods of birth control. It is probable that in 1947 only parts of the urban elite were practising modern methods of birth control (e.g. using condoms). However the 1998-99 National Family Health Survey indicated that about 48 percent of all currently married women were using contraception - most of them with modern methods (IIPS and ORC Macro 2000).

The Indian family planning programme is often dismissed as a 'failure'. But in my view this is an unjust and rather too simple characterisation. Among other things, the programme's *proper* evaluation would need to take account of:

(i) the sheer size and complexity of the task which it has had to tackle, namely reducing the birth rate in a huge, poor, poorly educated, and largely rural population

(ii) the aforementioned fact that in many respects India has been a *pioneer*; this is most commonly illustrated by the statement that it was the first country in the world to announce an official family planning programme (in 1952). But actually India has led the world in many other ways too (e.g. in the development of several methods of sterilisation). The main point I am making, however, is that it is particularly difficult to be a pioneer, and that pioneers inevitably tend to make more mistakes than those who follow

and, (iii) the fact that in the past some politicians have shied away from their duty of ensuring that Indian women, and men, have a real 'right to choose'. By this I mean their responsibility of making sure that everyone has access to safe, effective and affordable methods of contraception. Indeed there are still significant parts of the country where this 'right to choose' needs to be expanded. But this requires political backing and greater resources.

Of course, India's family planning programme has had its failings. For example, it has been much too 'target-bound', and for much too long it has badly neglected the promotion of *reversible* forms of contraception (today about eighty percent of all married women who are currently using a modern method of contraception are relying upon sterilisation (i.e. tubectomy)). Nevertheless, despite its problems, there can be little doubt that the Indian birth rate would be somewhat higher today, and the country's population would be larger still, if the family planning programme had not existed.

I now turn to consider mortality. In an increasingly integrated world no country can really claim complete responsibility for all the developments which happen within its own frontiers. Nevertheless, India can claim substantial credit for improving its level of mortality.

In 1947 national life expectancy was probably about 33 years. Today, in 2003, it is probably about 62 years. Arguably, this represents the greatest single improvement of life in India since Independence. The story is much too complicated to be told here, but a few key elements can be mentioned.

In 1947 malaria was the most important single disease - there were tens of millions of cases, and probably hundreds of thousands of deaths from malaria each year. However, thanks to new technologies and the national anti-malaria campaign, by 1965 there were estimated to be only 100,000 active cases of malaria in the country and no malaria deaths (Learmonth 1988). Of course, for many reasons - including administrative complacency - the disease has revived since 1965 and it is a major problem today, although thankfully not with the virulence or the scale of the late 1940s. Another notable milestone was the elimination of smallpox in 1975. It is worth recalling that even as late as the 1950s India experienced an average of about 64,000 deaths from smallpox each year (Banthia and Dyson 1999). Very major mortality reductions have also been recorded for diseases like plague (despite its brief reappearance in 1994) and cholera. And the food situation has improved too - the last period of major 'excess mortality' from food shortage was in the early 1970s (see Dyson and Maharatna 1992).

In the late 1970s and early 1980s there was some speculation that the pace of mortality improvement in India might begin to slacken. The argument was that the comparatively 'easy' mortality gains of the 1950s and 1960s - which had been won partly from immunisation and anti-vector spraying campaigns - could not be sustained unless there were major improvements in levels of living (e.g. see Cassen and Dyson 1976; Ruzicka 1984).

However, there seems to have been no particular slackening in the pace of overall mortality decline. Again, the explanation is complex, and the fact that average levels of living have tended to rise is germane too. Among other things, there has probably been continued improvement in factors like safe-water provision, sanitation, and health-service coverage. In urban areas many modern medicines can be freely purchased over the counter. Importantly, there has been a

steady trend in the population towards the adoption of an increasingly *secular* attitude towards disease, sickness and ill-health. And since the early 1980s there have been large increases in child immunisation coverage. Today roughly 70 percent of Indian one-year olds are immunised for TB, DPT(i.e. diphtheria, pertussis and tetanus), polio and measles - and there have been major gains apropos the provision of tetanus antitoxin too (UNICEF 2000). As a result of these and other changes, India's infant mortality rate has fallen markedly and according to the Sample Registration System in the year 2000 it was 68 infant deaths per thousand live births - roughly one-third the level of 1947.

Of course, this considerable progress cannot possibly hide the scale of the many health problems which remain (on this see L. Visaria forthcoming (a)). For example, by many conventional measures of morbidity and nutrition - such as the incidence of stunting or anaemia - India still does *very* badly indeed. Thus whereas in countries in sub-Saharan Africa typically about 15 percent of births are of low birth weight (i.e. less than 2500 grams) in India the corresponding figure is about 33 percent (UNICEF 2000). Again, it seems that there has been little decline in death rates from respiratory disease since 1947, and today tuberculosis - that archetypal 'disease of poverty' - is certainly one of the country's most intractable health problems. Again, the life expectancy of Indian females probably now does exceed that of males - but not to the extent that it 'should' do given the country's overall level of mortality. And, of course, in parts of northern India it is likely that male life expectation still does exceed that of females. Again, infection rates for HIV/AIDS are certainly increasing. According to the United Nations, India now has the second greatest number of adults (i.e. persons aged 15-49) infected with HIV, after South Africa (the respective figures, relating to 1999, are 3.7 and 4.1 million). HIV prevalence among Indian adults is estimated at about 0.7 percent (United Nations 2002:105). As in many other countries, looking at the last two decades it must be said that the government has been slow in recognising that HIV/AIDS might become a big problem; and politicians have shown the common and related characteristics of complacency and denial. A final health issue worth mentioning is that rural death rates are generally much higher than those for urban areas - reflecting, among other things, significant differences in health service provision. According to the Registrar General, during the period 1992-96 the life expectation of the country's urban population was almost seven years higher than that of the rural population (Registrar General, India 1999). This is a *very* big difference. There has been lots of discussion about 'missing women'; perhaps there should be some consideration of 'missing peasants'!

This brings me to some remarks about migration and urbanisation.

Today the population of India is certainly more mobile than it was in 1947. But as Pravin Visaria often stated (e.g. see Visaria 1997) India remains a country with a surprisingly *low level* of urbanisation and where the *pace* of urbanisation too has been rather *slow*. Thus whereas the 1951 census classed about 17 percent of the population as living in urban areas, by the 2001 census this figure had only risen to 28 percent. Of course, combined with the country's huge population this still means that today more than 285 million people live in urban areas.

In 1951 only five Indian cities had populations in the vicinity of - or greater than - one million. They were: Kolkata (then Calcutta) which was the largest with about 4.7 million inhabitants; Mumbai (Bombay) with about 3.2 million; Chennai (Madras) with 1.5 million; Delhi with 1.4 million; and finally Hyderabad with about 1.1 million (P. Visaria 2000). However the 2001 census identified no fewer than *thirty-five* so-called 'million plus' urban agglomerations and cities. These are Mumbai (now the largest with 16.4 million), Kolkata (13.2m), Delhi (12.8m), Chennai (6.4m), Bangalore (5.7m), Hyderabad (5.5m), Ahmedabad (4.5m), Pune (3.8m), Surat (2.8m), Kanpur (2.7m), Jaipur (2.3m), Lucknow (2.3m), Nagpur (2.1m), Patna (1.7m), Indore (1.6m), Vadodara (1.5m), Bhopal (1.5m), Coimbatore (1.4m), Ludhiana (1.4m), Kochi (1.4m), Visakhapatnam (1.3m), Agra (1.3m), Varanasi (1.2m), Madurai (1.2m), Meerut (1.2m), Nashik (1.2m), Jabalpur (1.1m), Jamshedpur (1.1m), Asanol (1.1m), Dhanbad (1.1m), Faridabad (1.1m), Allahabad (1.1m), Amritsar (1.0m), Vijayawada (1.0m), and Rajkot (1.0m) (Registrar General, India 2001b).

The most important contributory factor behind the growth of India's urban population during the past five decades has been *urban natural increase*, i.e. the excess of urban births over urban deaths. My preliminary estimates suggest that between 1991 and 2001 at least 56 percent of the growth of India's urban population was due to urban natural increase. During recent decades migration from rural to urban areas has been an important, but nevertheless secondary factor behind urban population growth (P. Visaria 1997).

As is well known, the vast majority of people classed by the census as 'migrants' are *women* - most of whom changed their place of residence when they got married. The last census for which at the moment there are detailed migration data - that of 1991 - suggests that females

predominate in virtually *all* types of migration, especially over shorter distances. There are good reasons to believe that the volumes and rates of so-called 'circulatory' migration have declined during recent decades; and conversely, that *commuting* has increased significantly (P. Visaria 1997). There are signs too that rates of interstate migration have fallen. Although recent decades have seen increasing economic disparities between India's states, this does not seem to have generated a rise in out-migration rates from poor states, or in-migration rates to better-off states (Kundu and Gupta 2000). That said, certain basic features of the country's overall pattern of interstate migration echo across the decades. Thus people tend to move out of UP and Bihar. And the main foci of attraction are Delhi/Haryana and Maharashtra/Gujarat - both of which contain dynamic regional urban systems (the latter, of course, embracing Mumbai and Ahmedabad).

The scale of international migration from India has never been great - especially when compared to the massive size of the country's population. Nevertheless it is estimated that in the early 1990s, among other overseas destinations, there were about 1 million people of 'Indian origin' living in the UK, another 1 million living in the USA, and roughly 2 million living in the Gulf. Virtually all of these people (or their parents) departed from India in the period since 1947 (P. Visaria and L. Visaria 1995). Through remittances, they make a significant contribution to the country's balance of payments. However, perhaps the most profound effect on India's population arising from international migration since the 1960s has occurred through the introduction of new ways of *thinking* and *behaving* - not least, with respect to aspects of family and personal life, including the common use of contraception. In short, past international migration has, through mechanisms like the return visits of Indians resident overseas - and their children - had an inordinate influence by helping to spread elements of a so-called 'western' lifestyle (along with the influence of the mass media, perhaps especially television). The results are particularly evident among better-off young people living in the big cities.

From 2003 until 2026 and beyond

So much for the past and the present, I now turn to aspects of the future. Here I draw on results from the demographic parts of a major project, dealing with the future of India, on which, with others, both Leela and Pravin Visaria worked.² To reiterate, I confine myself to selected broad conclusions; those interested in detailed justifications for some of the following statements must

² See footnote 1 above.

look elsewhere (see Dyson, Cassen, and L. Visaria, forthcoming).

By the year 2026 India's population will have grown to about 1.4 billion (see Dyson 2003, forthcoming). This conclusion is supported by the results of other recent demographic projections which also use the results of the 2001 census as a basis on which to project. Thus the 'realistic' scenario of Mari Bhat (Bhat 2001a) gives a figure of 1,403 million for the year 2025; and the projections made by Natarajan and Jayachandran for the Population Foundation of India (see Natarajan and Jayachandran 2001a, 2001b) yield a figure of 1,414 million for the year 2026. The exact figure which emerges from the state-level projections of our project is 1,419 million for the year 2026 (see Dyson forthcoming).

There is little doubt that levels of fertility will generally continue to fall. As noted above, in some states - particularly in the south - fertility is already close to, or fast approaching, the 'replacement' level of about 2.1 births. Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Punjab and West Bengal all fall into this category. Gujarat and Haryana should achieve replacement level fertility within the next decade or so. However, it will take appreciably longer for the populous northern states of Madhya Pradesh, Rajasthan, Bihar and Uttar Pradesh to achieve replacement fertility. In UP, especially, fertility per woman could still be significantly above the replacement level in 2026 (Dyson 2003).

A key question - to which we do not yet know the answer - is: how far below 2.1 births per woman will levels of fertility fall? Most demographic projections agree that fertility levels *will* fall below 2.1. For example, Natarajan and Jayachandran assume a lower 'floor' for future fertility of 1.6 births; Mari Bhat (Bhat 2002) has tentatively argued for a figure of 1.7; and my own central projections employ a figure of 1.8 (Dyson 2003, forthcoming). Levels of fertility may well fall below replacement in the future - as, increasingly freed from the burdens of childbearing, women's life cycles enable them to play a larger role in the labour force (Dyson 2002). Also, and perhaps more importantly, there remains a strong commitment to curb future population growth in India; and this fact may well mean that family planning efforts are continued, even after replacement fertility has already been achieved. However, just how far fertility will fall is important - because it will have a big influence on how much India's population is going to grow during the coming decades (see below).

Turning to future mortality, it seems likely that average levels of life expectation will continue to improve. My own projections suggest that life expectancy for males and females will be 67 and

71 years respectively by the period 2021-26 (see Dyson 2003, forthcoming). The figures used by Mari Bhat (Bhat 2001a) are very similar; although those of Natarajan and Jayachandran (2001b) are more optimistic (68.9 and 73.5 years for males and females respectively by 2021).

Leela Visaria (forthcoming (a)) has documented how in the period since 1947 there has been a marked shift in India's overall mortality profile - deaths from infectious diseases have declined in relative prominence, while deaths from non-communicable diseases (e.g. cancers and circulatory ailments) have become more significant. This shift will almost certainly continue into the near-term future. Some infectious diseases - like polio, guinea worm, yaws, and perhaps leprosy - may well be eradicated. Certainly levels of childhood immunization can be raised much more (especially in parts of the north). Rising levels of education and income, plus future improvements in infrastructure - should also contribute to an increase in the country's average level of life expectation. Also, the fact of continuing fertility decline should bring benefits to the conditions influencing maternal and child death rates. Finally, the sheer size of the mortality differentials which currently exist in India - for example between urban and rural areas, and different states - underlines that there is considerable scope for future improvement.

This is *not* to say that very significant health problems will not remain in the coming decades. They will. As Leela Visaria argues (forthcoming (a)) India's future efforts at controlling infectious disease are likely to be only partially successful. For example, malaria is likely to remain as a major problem. Tuberculosis too constitutes a very formidable challenge - as drug resistant forms of the disease proliferate, and the spread of TB is also fuelled by HIV/AIDS. Moreover, HIV/AIDS could become the leading cause of death sometime during the next two decades.

I noted above that, although there is considerable uncertainty about the number of people currently infected and, still more, about the future course of the disease, United Nations estimates suggest that around 1999 about 3.7 million adults in India were infected with HIV. Estimates for 1998 released by India's National Aids Control Organisation (2000) imply that HIV prevalence is significantly higher in the southern states; in increasing order of adult infection they are: Tamil Nadu (0.72 percent), Kerala (0.74), Karnataka (0.93), Andhra Pradesh (1.16) and Maharashtra (1.27). More men are infected with HIV/AIDS than women; in 1998 the estimated sex ratio (m/f) of adult infection for the country as a whole was 1.75. My own calculations suggest that in these southern states HIV/AIDS will slow the rise in life expectation during the next 10 to 15 years (see Dyson and Hanchate 2000; Dyson forthcoming). Life

expectation will generally continue to rise - but not as fast as it would have done in the absence of HIV/AIDS. It is much more difficult to foresee what will happen after about 2015, although it seems likely that the situation will continue to deteriorate. The disease may well spread increasingly into the four most populous northern states which at the moment appear to be relatively unaffected; and it will increasingly affect the female population too. Personally I do not believe that levels of HIV infection in India's major states will approach those which are found in parts of southern Africa - where 20 percent of all adults are currently infected, and where within the next 10 to 15 years most of these infected people will die of AIDS. However, for several reasons HIV/AIDS is probably the single most important health issue facing India today. The numbers of people infected with HIV will almost inevitably rise. With its much greater population, India will probably overtake South Africa as the country with the largest number of infected people. Also, there is the aforementioned deadly interaction with tuberculosis. Moreover, no one can be sure that levels of HIV infection in some states will not reach, say, 5 or 10 percent; if such a situation were to arise then the total number of people infected will beggar belief. Clearly, the rise in the numbers infected must be restricted to the *very greatest extent possible*.

Turning briefly to future patterns of migration and urbanisation, the project work suggests that by 2026 roughly 36 percent of India's population will be living in the urban sector. We also estimate that there will be nearly seventy 'million plus' cities by that time. However, these estimates assume that there will be no major change in the definitions and practices which are used to classify places as 'urban'. Yet it seems likely that the extent to which areas are classed as 'urban' will be broadened in the future - as happened, for example, in Tamil Nadu between 1991 and 2001.³ Of course, if this happens then the 'urban' population will be larger still, and there will be even more million plus cities.

By the year 2026 the great urban agglomerations of Mumbai and Delhi may each have populations in the vicinity of, or approaching, 30 million. And there must be some chance that the population of Delhi will have overtaken that of Mumbai by 2026. In every major state the populations of the towns and cities (i.e. the urban population) will grow *much* faster than those of the rural areas. Indeed, it is likely that even assuming no change in what is held to constitute an 'urban' area, over half of all demographic growth in India during the next 25 years will end up living in the urban sector. In the main southern states the size of the 'rural' populations are set to increase by relatively modest amounts. But the most populous northern states - MP, Rajasthan,

³ The level of urbanization in Tamil Nadu rose from 34.2 percent in 1991 to 43.9 percent in 2001, largely

Bihar and UP - are going to experience very considerable increases in the sizes of *both* their urban and their rural populations.

due to the reclassification of previously rural areas as urban.

Although most migration will continue to be rural-to-rural, the process of urbanisation will help to ensure that migration flows will continue to become increasingly urban-oriented over time. Interstate migration rates may continue to fall - in part because the rise in the number of 'million plus' cities dotted around the country will mean that people will be more able to migrate to such a city without departing from their home state. Although still small in relative terms, the numbers of people leaving India for North America, Europe, Australia, and some other destinations, seems set to rise, but so too do the numbers entering the country from Nepal and Bangladesh.

The preceding paragraph draws on results from our state-level population projections. Accordingly, this is an appropriate point to return to the issue of the *scale* of India's future population growth. It should be clear that, because fertility levels are generally significantly higher in northern India, the country's future demographic growth will occur disproportionately in the north. My projections imply that 55 percent of all population increase in the period 2001-26 will happen in MP, Rajasthan, Bihar and UP. By 2026 these projections imply that the populations of these four states will be respectively 45, 47, 51 and 55 percent larger than they were in 2001. In contrast the populations of Kerala, Tamil Nadu and Andhra Pradesh will only increase by about 15-20 percent over the same time period (see Dyson 2003, forthcoming). So it is in the main northern states that expanded family planning efforts could really make a significant difference to the total volume of future population growth (see L. Visaria forthcoming (b)).

Such differential demographic growth, particularly between the country's 'north' and 'south', could potentially be a source of political stress. Since 1977 representation in Parliament has been fixed on the basis of the 1971 census results. The 'freeze' was to be lifted after the 2001 census, when a reallocation of parliamentary seats was to happen. The recent National Population Policy, however, recommended that the 'freeze' be extended to 2026 (Government of India 2000: 11). Also, the census results in 2001 showed a widening of demographic growth rates between the country's main northern and southern states. The 'freeze' in Parliament cannot continue forever. Yet its eventual lifting could be a source of tension.

If the country's population will be around 1.4 billion by 2026, Figure 1 puts this future growth into historical perspective, and it also addresses what may happen over the still longer run. In addition to summarising the result of our central 'standard' population projection for all-India - which represents the sum of separate state-level population projections, in which the lower 'floor' for fertility was set at 1.8 births per woman - it also shows the results from 'high' and 'low'

variant projections generated using fertility 'floors' of 2.1 and 1.5 births respectively. By 2026 there is not much difference in the projected size of the population between the three variants. But by 2051 the differences are substantial - being 1.458 billion (low), 1.579 billion (standard) and 1.731 billion (high). To comment on these figures, it seems extremely unlikely that the country's population will not exceed 1.5 billion at some time in the coming decades. Indeed, a figure of about 1.6 billion seems fairly likely. And, while it is unlikely, even a figure approaching 1.7 billion cannot be ruled out. Personally I feel that a figure just short of 1.6 billion is most probable. And in this context it is worth noting that Natarajan and Jayachandran's projections (2001a, 2001b) - which also extend to the year 2051 - yield a figure of 1.646 billion. Moreover, the latest UN medium-variant (i.e. 'best-guess') projection puts the total population of India at 1.572 billion in 2050. The corresponding population figure for China then is only 1.462 billion (United Nations 2002).

The addition of half a billion people - perhaps more - to India's population will have major administrative and political implications. Some of the bigger states may split up.⁴ Moreover population growth on this scale, coupled with increased levels of *energy use*, will pose a significant challenge to the environment. It is a challenge that will have to be faced over a very extended period of time, and with considerable population growth occurring in other countries too.

That said, the results of our project's general deliberations - which, among other things, address aspects of the country's future environment, agriculture, and key dimensions of its human development (e.g. health, education, employment) - are for the most part *significantly more upbeat than downbeat* (see Dyson, Cassen, and L. Visaria, forthcoming). And, as regards the *economy*, the projected demographic trends are at least a *potential* source of promise. Thus India's age dependency ratio - i.e. the ratio of the combined populations aged under 15 years and 60 years and over, to the population aged 15-59 - is set to decline for the coming 25 to 30 years; indeed, most of the population growth which will happen during this period will occur in the main *adult* working age range (i.e. ages 15-59) (Dyson forthcoming). The explanation for this is the expected substantial fall in fertility. Moreover population aging during this period will

⁴ Populous states have already experienced administrative changes linked, in part, to their scale. The bigger states become the more likely they are to contain minorities which are sufficiently large to merit, and agitate for, the creation of new states. Jharkhand, Chhatisgarh and Uttaranachal - all states with strong tribal representations, carved respectively from Bihar, MP and UP - illustrate these processes.

be fairly modest - although it will be more significant in the country's south (because of that region's earlier fertility decline) and over the longer run (i.e. beyond 2026).

In their now classic book, published in 1958, Ansley Coale and Edgar Hoover explored the economic implications of fertility decline, with particular reference to India. They argued that per capita incomes would be appreciably higher under a 'declining fertility' scenario compared to a 'sustained fertility' scenario. The explanation, essentially, was that fertility decline raised the possibility of increased levels of savings and investment. For several decades this explanation was often either overlooked or played down. But, more recently, economists have woken up to its role in contributing to the so-called 'East Asian economic miracle' (e.g. see Bloom and Williamson 1998). There is no doubt that the coming two or three decades hold out the prospect of a significant 'demographic bonus' for India (see Bhat 2001b). But it is a only *potential* benefit, rather than a certainty. In particular, the chances of a reduced age dependency ratio leading to higher levels of savings and investment must be grasped - rather than wasted on consumption.

With the award of a scholarship from the Population Council in New York, Pravin Visaria joined Princeton University to study for an MA in Economics and Demography during the academic year 1959-60. And he then stayed on to take his PhD in Demography - also in the Department of Economics at Princeton. Ansley Coale was one of his research supervisors. Therefore Pravin was very familiar with *Population Growth and Economic Development in Low Income Countries* (Coale and Hoover 1958). And he was well aware of this significant potential - essentially the possibility for 'capital deepening' - which now lies ahead.

Conclusion

In conclusion, although India has made considerable demographic progress in the decades since 1947, it seems virtually certain that the country's population will reach about 1.4 billion by the year 2026, and it is probable that it will subsequently grow to roughly 1.6 billion by the middle of the present century. The importance of extending and supporting the 'right to choose' in contraception - especially in the country's north - cannot be underplayed. Turning to mortality, despite the persistence of substantial poverty and major health problems, it seems likely that average life expectation will continue to rise during the medium-term future (although whether levels of *morbidity* will improve commensurately is another matter). That said, the HIV/AIDS situation seems likely to get worse, and it deserves the very closest attention. India's coming

demographic expansion will pose some serious challenges - for example, political, administrative, and environmental.

However the country's coming demographic changes carry some significant *benefits* too. Thus there is the aforementioned potential 'demographic bonus'. Perhaps even more important is the fact that over the long run fertility decline is likely to help to transform the lives of Indian women - as they become more and more liberated from lives that are dominated by childbearing and associated concerns of the domestic domain. Finally, urbanisation is a process which will certainly continue; and, despite its associated problems, it too is generally a 'good thing'. For example, we have noted the much more favourable levels of mortality which prevail in the urban sector. Urban living holds out prospects for economies of scale. Indeed, in my view urbanisation is absolutely central to what constitutes the modern process of 'development' (Dyson 2001b). So, to reiterate, the India's prospects seem to be significantly more upbeat than downbeat over the medium term future.

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